

# ABSTRACT OF THE DISCLOSURE

In an air-fuel ratio control system, a gain  $K_h$  is adaptively determined on the basis of a value  $z$  obtained by multiplying a target fuel amount difference value  $\Delta y_m$  (derivative value of a target fuel amount) by an error  $e$  between a target excess fuel ratio (target  $\phi$ ) and an actual excess fuel ratio (actual  $\phi$ ) detected by an air-fuel ratio sensor. A value obtained by multiplying the target fuel amount difference value  $\Delta y_m$  by the gain  $K_h$  is determined as an F/F corrected value  $u_{cmp}$ . In this case, when the error  $e$  between the target  $\phi$  and the actual  $\phi$  is determined in consideration of the fact that a controlled system has dead time  $d$ , a target  $\phi_d$  at the point in time going back in the past by the amount of the dead time  $d$  is used to obtain error  $e = \text{target } \phi_d - \text{actual } \phi$ .